

IN THE CLAIMS

What is claimed is:

1    1. A dynamic server directory system, comprising:  
2                 at least one relational table that includes a plurality of entries that can  
3                 each store location data, status data, and feature data of server processes in a  
4                 distributed computing system that services client requests; and  
5                 an interface that may provide at least one entry from the at least one  
6                 relational table to a client.

1    2. The dynamic server directory system of claim 1, wherein:  
2                 the location data of an entry may comprise a network address; and  
3                 the entry may include a server name to identify a specific server at the  
4                 network address.

1    3. The dynamic server directory system of claim 1, further including:  
2                 a route table that can indicate at least one communication route to a  
3                 server host and the status of said route.

1    4. The dynamic server directory system of claim 1, further including:  
2                 a plurality of dynamic server directory agents that reside on different  
3                 host machines than the dynamic server directory, each dynamic server directory agent  
4                 caching at least a portion of the at least one relational table.

1       5.     The dynamic server directory system of claim 1, wherein:  
2                          the relational table includes a key field that may be searched by a key  
3       prefix value that can filter entries according to client request criteria

1       6.     The dynamic server directory system of claim 1, further including:  
2                          a plurality of dynamic server directory agents that reside on different  
3       host machines than the dynamic server directory, each dynamic server  
4       directory agent forwarding new server process information to the dynamic  
5       server directory when a new server process is added; and  
6                          the dynamic server directory creating a new entry in the at least one  
7       relational table corresponding to the server process and forwarding the  
8       updated relational table to dynamic server directory agents.

1       7.     The dynamic server directory system of claim 1, wherein:  
2                          the distributed computing system includes at least two subsystems that  
3       provide different functions; and  
4                          the at least one relational table includes a plurality of relational tables,  
5       each relational table including entries corresponding to server processes of  
6       one of the subsystems.

1       8.     The dynamic server directory system of claim 1, wherein:  
2                          the at least one relational table includes a server relational table that  
3       identifies a server route corresponding to a given server process and a route

4            relational table that identifies a communication route corresponding to a given  
5            host machine.

1        9.      The dynamic server directory system of claim 8, further including:  
2                 the interface searches the server relational table and then the route  
3                 relational table to determine the route to a host machine for a given server  
4                 process.

1        10.     The dynamic server directory system of claim 1, further including:  
2                 a plurality of dynamic server directory agents that reside on different  
3                 host machines than the dynamic server directory, each dynamic server  
4                 directory agent receiving periodic status communications from at least one  
5                 server process and notifying the dynamic server directory when status  
6                 communications fail; and  
7                 the dynamic server directory changes entries in the at least one  
8                 relational table in response to status communication failures.

1        11.     The dynamic server directory of claim 10, further including:  
2                 a service master process that may subscribe with the DSD agent to be  
3                 notified of changes to the at least one relational table, the service master  
4                 performing at least one predetermined error response when the change to the  
5                 at least one relational table indicates a status communication failure has  
6                 occurred in a server process; and

7                   the dynamic server directory forwards changes in the at least one  
8                   relational table to the DSD agent.

1   **12.**   The dynamic server directory of claim 11, wherein:

2                   the predetermined error response may be at least one response selected  
3                   from the group consisting of: attempting to restart the server process  
4                   corresponding to the failure, logging the failure error, notifying a system  
5                   administrator, generating a work order for the server process corresponding to  
6                   the error, activating another server process as a back-up to the server process  
7                   corresponding to the failure, shutting down a host machine for the server  
8                   process corresponding to the failure, and rebooting a host machine for the  
9                   server process corresponding to the failure.

1   **13.**   The dynamic server directory of claim 1, wherein:

2                   a plurality of client processes that may subscribe to be notified of changes to  
3                   the at least one relational table, a client process performing a resubmission of all  
4                   requests sent on a particular currently valid server route when the change to the at  
5                   least one relational table indicates a failure in the server process, or the route to the  
6                   server process.

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1    14. A system, comprising:

2                 a plurality of servers that may perform predetermined operations

3                 according to requests from clients; and

4                 a dynamic server directory that includes a plurality of relational tables,

5                 each relational table storing feature information for the plurality of servers, the

6                 feature information being accessible by a client to determine which server

7                 may service a particular client request; and

8                 a plurality of dynamic server directory agents that may perform

9                 predetermined operations according to client subscriptions.

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1    15. The system of claim 14, wherein:

2                 the plurality of servers include storage servers that may access stored

3                 files and metadata servers that may access metadata for the stored files.

1    16. The system of claim 14, wherein:

2                 the dynamic server directory agent includes an interface that may

3                 provide access to the relational tables in response to an action selected from

4                 the group consisting of: the addition of a new entry to a relational table,

5                 deletion of a entry from a relational table, search for a key, search for a server,

6                 subscription to notification of changes in status, and maintenance of current

7                 process information..

1    17. The system of claim 14, further including:

2                   the plurality of servers reside on server host machines; and  
3                   each server host machine further includes a dynamic server directory  
4                   agent that caches at least a portion of at least one relational table and is  
5                   accessible by a client.

1   **18.**   A method of controlling client requests in a distributed computing system having a  
2       plurality of servers, comprising the steps of:

3                   maintaining server information in a dynamic server directory (DSD)  
4                   for the servers that indicates availability of a server for particular client  
5                   requests;

6                   caching server information in dynamic server directory agents  
7                   (DSDAs);

8                   selecting a server for a particular client request from server  
9                   information cached in a DSD;

10                  monitoring servers with DSDAs and forwarding server status  
11                  information to the DSD;

12                  changing server information in the DSD for a selected server in  
13                  response to server status information; and

14                  forwarding changed server information to DSDAs.

1   **19.**   The method of claim 18, wherein:

2                   selecting a server includes a client invoking an interface function of a  
3                   DSDA residing on the same host machine as the client.

1   **20.**   The method of claim 18, wherein:

2                 selecting a server includes searching a first server information  
3                 relational table to determine a server route including a host machine on which  
4                 a desired server resides, and searching a second server information relational  
5                 table to determine a route to the host machine.

1   **21.**   The method of claim 18, wherein:

2                 the server information includes  
3                         at least one server relational table having entries that comprise  
4                         server identification, server route identification including host machine  
5                         identification, and a server status indication for each server process,  
6                         and

7                         at least one route relational table having entries that comprise  
8                         host machine identification, route information, and host machine status  
9                         indication.

1   **22.**   The method of claim 21, further including:

2                 the plurality of servers includes a gateway servers that control access  
3                 to the distributed computing system, metadata servers that access metadata for  
4                 stored files, and storage servers that store files; and

5                 the at least one server relational table includes a gateway server  
6                 relational table, a metadata server relational table, and a storage server  
7                 relational table.